AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 5, 10, 11, 15, 20, and 35 as follows, without prejudice or disclaimer to continued examination on the merits:

Claim 1. (Currently Amended):

An optical node for an optical network transporting an optical datastream, the node comprising:

at least one port for optically coupling the node to at least one neighboring node;

a fault restoration element to adjust the operation of the node in response to a fault;

at least one optical sensor for measuring a first set of optical characteristics of the optical datastream at the node;

a signal sensor configured to receive a second set of optical characteristics of the optical datastream from an upstream optical device; and

a local controller correlating the first and second sets of optical characteristics and activating the fault restoration element if the correlated first and second sets of optical characteristics have values corresponding to a potential fault requiring activation of the fault restoration element, wherein said controller is a microprocessor having a software program residing on the microprocessor, the software program including a list of possible faults and corresponding restoration actions as a function of the first and second of optical characteristics, wherein said software program records the result of the restoration instance and communicates the result of the restoration instance to the optical network, and wherein said software program communicates a message alerting other nodes of the optical network of an upcoming restoration instance prior to the restoration instance.

Claims 2.-4. (Canceled)

Claim 5. (Currently Amended):

The node of Claim [2] 1, wherein said software program includes a list of internal components likely to have failed as a function of said first and second set of optical characteristics, said software program preparing a list of components likely to have failed for each restoration instance.

Claim 6. (Original):

The node of Claim 1, wherein said restoration element is selected from the group consisting of: a line switcher, a redundant electrical element, and a redundant electro-optical element.

Claim 7. (Original):

The node of Claim 1, wherein said upstream device is an optical spectrum analyzer.

Claim 8. (Original):

The node of Claim 1, wherein said upstream device is an upstream node having at least one optical sensor residing in the upstream node.

Claim 9. (Original):

The node of Claim 8, wherein the signal sensor is an optical receiver for receiving status messages via an optical channel, whereby the upstream node communicates said second set of optical characteristics as a status message via an optical fiber.

Claim 10. (Currently Amended):

An optical node for an optical network, the node comprising:

at least one input port for receiving an optical data steam having a plurality of channels;

a plurality of output ports for communicating the data stream to at least one other node via at least one optical fiber link;

a line switcher arranged to select an optical pathway for the data stream between two of the ports of the node in response to a line switch command;

a demultiplexing stage arranged to select at least one channel from said datastream, said stage including at least one redundant electro-optic element configured to replace a defective electro-optic element of said stage in response to an equipment switch command;

at least one optical sensor configured to measure a first set of optical characteristics of the channels;

a signal sensor for receiving data from an upstream device on a second set of optical characteristics of the channels upstream of the node; and

a local controller configured to generate the switch commands, the local controller comparing said first and second set of optical characteristics to detect a loss of signal in one or more of the channels, the controller initiating a line switch, based on said comparing, to isolate a line fault or an equipment switch to isolate an equipment fault, wherein said controller is a microprocessor having a software program residing on the microprocessor, the software program including a list of possible faults and corresponding restoration actions as a function of the first and second of optical characteristics, wherein said software program records the result of the restoration instance and communicates the result of the restoration instance to the optical network, and wherein said software program communicates a message alerting other nodes of the optical network of an upcoming restoration instance prior to the restoration instance.

Claim 11. (Currently Amended):

The node of Claim 10, wherein said ~~local controller comprises a micro-processor having a software program residing on said micro-processor for generating the line switch commands and the equipment switch commands, the~~ software program is operable for comparing said first and said second set of optical characteristics against a problem list to determine if a fault has occurred requiring the controller to initiate a line switch or an equipment switch.

Claim 12. (Original):

The node of Claim 11, wherein said software program includes a fault detector detecting potential faults as a function of the problem list, a line switch engine coupled to the fault detector for activating the line switcher in response to the instructions of the fault detector, and an equipment switch engine coupled to the fault detector for activating the redundant electro-optic element in the node in response to instructions form the fault detector.

Claim 13. (Original):

The node of Claim 10, wherein the upstream device is an optical spectrum analyzer.

Claim 14. (Original):

The node of Claim 10, wherein the upstream device is a neighboring node.

Claim 15. (Currently Amended):

An optical node for an optical network, the node comprising:

a plurality of ports for receiving an optical data stream having a plurality of optical channels and communicating the data stream to at least one other node;

at least one fault restoration element to adjust the operation of the node in response to a fault;

at least one optical sensor configured to measure a first set of optical characteristics of the channels in the node;

at least one transceiver for communicating optical network status information via an inter-node optical communications channel with a neighboring node, the optical network status information including a second set of optical characteristics of the optical channels determined by sensors residing in at least one other node of the optical network, wherein the optical network status information includes the publication of a planned line switch or equipment switch in another node and a local controller is configured to interpret the planned line switch or equipment switch as a request to not initiate a local

line switch command or an equipment switch command during a time period corresponding to the planned line switch or equipment switch; and

a local controller configured to activate the at least one fault restoration element if a comparison of the first and second sets of optical characteristics indicates a potential fault requiring activation of the fault restoration element.

Claim 16. (Canceled)

Claim 17. (Original):

The node of Claim 15, wherein the optical network status information includes a channel map of active channels throughout the optical network.

Claim 18. (Original):

The node of Claim 15, wherein said at least one restoration element includes:

a line switcher arranged to select an optical pathway for the data stream between two ports of the node in response to a line switch command; and

a demultiplexing stage arranged to select at least one channel from said data stream, said stage including at least one redundant electro-optic element configured to replace a defective electro-optic element of said stage in response to an equipment switch command;

wherein the local controller is configured to generate the switch commands, the local controller comparing said first and said second set of optical characteristics to detect a loss of signal in one or more of the channels, the controller initiating a line switch to isolate a line fault or an equipment switch to isolate an equipment fault.

Claim 19. (Canceled)

Claim 20. (Currently Amended):

A wavelength division multiplexing optical network, comprising:

a first node containing a first optical sensor, a first transceiver for receiving and

transmitting data on an inter-node channel, and a first local microprocessor for controlling a first line switcher and a first set of redundant electrical elements, the first local microprocessor transmitting a first status report on the optical characteristics of the channels in said first node via said first transceiver;

a second node containing a second optical sensor, a second transceiver for receiving and transmitting data on the inter-node channel, and a second local microprocessor for controlling a second line switcher and a second set of redundant electrical elements, the second local microprocessor transmitting a second status report on the optical characteristics of the channels in said second node via said second transceiver;

a primary optical fiber line linking said first and said second nodes; and

a protection optical fiber line linking said first and said second nodes;

wherein each local microprocessor determines whether to perform a line switch or an equipment switch as a function of the optical power characteristics of the local node correlated with the status reports from the other nodes of the optical network via the inter-node channel, wherein each local microprocessor records the result of any line switch or equipment switch and communicates the result of the line switch or equipment switch to the other local microprocessor, and wherein each local microprocessor communicates a message alerting the other local microprocessor of an upcoming line switch or seuipment switch prior to the line switch or equipment switch.

Claim 21. (Original):

A wavelength division multiplexing optical ring network, comprising:

a first node containing a first optical sensor, a first transceiver for receiving and transmitting data on a first inter-node channel, and a first local microprocessor for controlling a first line switcher and a first set of redundant electrical elements, the first local microprocessor transmitting status reports on the optical characteristics of the channels in said first node via said first transceiver;

a second node containing a second optical sensor, a second transceiver for receiving and transmitting data on the first inter-node channel, a third transceiver for

receiving and transmitting data on a second inter-node channel, and a second local microprocessor for controlling a second line switcher and a second set of redundant electrical elements, the second local microprocessor transmitting status reports on the optical characteristics of the channels in said second node via said second transceiver;

a third node containing a third optical sensor, a fourth transceiver for receiving and transmitting data on the second inter-node channel, and a third local microprocessor for controlling a second line switcher and a third set of redundant electrical elements, the third local microprocessor transmitting status reports on the optical characteristics of the channels in said third node via said fourth transceiver;

a first primary optical fiber line linking said first and said second nodes;

a first protection optical fiber line linking said first and said second nodes;

a second primary optical fiber line linking said second and third nodes;

a second protection optical fiber line linking said second and third nodes; and

at least one additional optical element linking said nodes into an optical ring;

wherein each of the microprocessors determines whether to perform a line switch or an equipment switch in the node which it resides as a function of the optical characteristics sensed at the local node and the status reports received from the other nodes.

Claims 22.-27. (Canceled)

Claim 28. (Previously Presented):

A method of fault detection and isolation in a node of a wavelength division multiplexing optical network comprising a plurality of nodes coupled to each neighboring node by at least two fibers, each node having at least one local optical sensor for each channel linked to a local tributary network, at least one transceiver for communicating data to each neighboring node that it is coupled to, and a local microprocessor for controlling a local line switcher and redundant demultiplexing elements residing in the node, the method comprising the steps of:

sensing the optical power characteristics of all of the optical channels traversing

the node;

sensing the optical power characteristics of each channel linked to the local tributary network;

receiving reports on the optical characteristics of the optical channels in neighboring upstream nodes;

updating a status list of measured channel characteristics in the node and in neighboring upstream nodes;

determining if the power level of one of the channels drops below a predetermined level;

waiting a preselected period of time to receive a status update from the upstream nodes;

selecting an equipment switch decision if a correlation of the channel power distribution between the node and upstream nodes indicates a likelihood that a failure has occurred in an electro-optic element in the node;

notifying downstream nodes that an equipment switch will be made; and

activating redundant electro-optic elements in the node.

Claims 29.-34. (Canceled)

Claim 35. (Currently Amended):

A method of coordinating the action of the nodes of an optical network to perform a fault detection and isolation network function, each node of the network system creating status reports of fault detection and isolation between optical network nodes, each node including at least one local optical sensor for measuring optical characteristics of the datastream at the local node, at least one transceiver for communicating data to each neighboring node that it is coupled to via a fiber optic link, and each node having a local controller for controlling at least one local restoration element, the method comprising the steps of:

sensing a first set of optical characteristics of the datastream at a first node;

updating a channel map of active channels at the first node based on the sensed

optical characteristics;

communicating the updated channel map to a neighboring second node via the fiber optic link;

sensing a second set of optical characteristics of the datastream at the second node; [and]

comparing the second set of optical characteristics to the channel map to determine if a fault has occurred requiring the controller at the second node to activate a restoration element[.]; and

communicating a message alerting the first node of an upcoming activation of the restoration element prior to the activation of the restoration element.

Claim 36. (Canceled)

Please cancel Claims 2-4, 16, 19, 22-27, and 36 as indicated above, without prejudice or disclaimer to continued examination on the merits.